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Public Holdings in Massachusetts.

THE third annual report of the Trustees of Public Reservations in Massachusetts shows that the prevailing financial depression has prevented that body from receiving any new trusts during the past year, and confines itself, therefore, to drawing attention to the gradual encroachments of private owners upon commons, shores and other property which ought to be protected by the towns to which they belong, and preserved for the use and pleasure of the people.

It also shows that the example of the Massachusetts society has attracted attention in England, and that in October, 1893, an article was published in the English *Spectator* descriptive of the powers and purposes of the "Massachusetts Trustees of Public Reservations," followed by several letters indicating a desire for the establishment in the mother country of an organization endowed with powers similar to those possessed by the Board here. One of these letters suggests that it would be quite as much to the purpose for the British Government to expend money in buying natural scenery as to spend thousands in purchasing pictures for the National Gallery; and that if there were a body furnished with an annual grant and empowered to purchase property of national interest, it could often acquire places of note at a moderate cost. This letter further states that the waterfall of Lodore was in October advertised for sale; that Snowdon had been in the market shortly before; and it represents that fine scenery is apt to go at extraordinarily low prices from its having no agricultural value, as it is usually mountainous and wild, and worth little or nothing to the farmer.

In December an American newspaper paragraph reported the organization in England of "The National Trust for Places of Historic Interest or Natural Beauty," with the Duke of Westminster, Lord Dufferin, Lord Rosebery, Sir Frederic Leighton, Professor Huxley, Miss Octavia Hill and other persons distinguished in art, letters or practical affairs, as members of its provisional committee, for the purpose of acting as general trustee for all property intended for the use and enjoyment of the nation at large. The function of the trust is to accept from private owners of property gifts which can only be made when there is a perpetual custodian and administrator, and it will be incorporated under the Joint Stock Companies' Act, and endowed with special privileges in consideration of its responsibilities. The Standing Committee of the Massachusetts Board suggests, apropos of this action, that though Massachusetts possesses no such rich historical treasures as are to be found in England, "she still does possess great wealth of beautiful, though now threatened, natural scenery, and an interesting, though rapidly disappearing, store of archæological and historical sites, such as Indian camps and graves, border forts and colonial or literary landmarks," which ought to be acquired. A preliminary, but incomplete, list is annexed to the report of those who have given lands for public reservations in Massachusetts up to this time, showing that since the formation of the society in 1891 it has received bequests from more than eighty-four donors, a most encouraging exhibition of the public spirit which animates individuals in the Bay state. The fact that eighteen of the early settlements in Massachusetts set apart "training-fields," which have survived as public reservations until the present day, shows the wise forethought of the founders of those towns, a forethought which we trust will be shared by those who now have the opportunity to acquire property at small cost for the benefit of the future population.

Some of the duties of the original Board have now passed over to its offspring, the Metropolitan Park Commission, which body, endowed with a right of eminent domain, and equipped with a million dollars to work with, has been engaged in securing great forest-reservations in the Blue Hills and the Middlesex Fells, and it is understood that a large part of Revere Beach will also be obtained by it. This Commission, with the Hon. Charles Francis Adams at its head, has by its extended powers been able to accomplish what the Trustees of Public Reservations could only suggest. Outside of the range of the Metropolitan District the latter Board is the only ready instrument through which the admirers of any beautiful and historic spot can provide for its preservation and perpetual care, where there is no existing local park commission.

Many towns are unwilling to accept bequests, so that it is of great use to the public to have a legal opportunity to bestow property which the owners or would-be purchasers desire to safely convey for the general benefit of a community which may be too short-sighted to avail itself of a gift. It was only with great reluctance that Plymouth could be induced to accept the generous gift from Mr. Nathaniel Morton and others, of the park which is now its pride, but for which this year it has refused to make any appropriation. A similar difficulty was experienced in Lynn, and as it takes years sometimes to educate a community it is fortunate that during the process there is a protector of the property at hand.

The report on the shore-towns of Massachusetts, compiled by Mr. H. B. Hastings, the agent of the society, is a melancholy chapter of public lands sacrificed and public rights neglected and lost. In former volumes of GARDEN AND FOREST a full account of the public holdings along the shore of the state was given, together with the history of the steps by which a large portion of them has passed under private or corporate control, so that the people are fenced away from the beach and only permitted to enjoy the companionship of the sea by sufferance or for a fee. The story, as revised up to the present time in this report, is one of an inheritance squandered through lack of appreciation of its value. Of course, the condition in some towns is worse than it is in others, but there is no need here to state special instances. One cannot read of highways closed, of grounds dedicated to public use to which the public is now denied admission, of so called water-parks turned into dumping-grounds, of unresisted encroachment upon public lands everywhere, without some indignation. And yet this practical stealing of the public land

has taken place before the eyes of its rightful owners, who generally have made no protest because they had no appreciation of its value. Even when attention is now called to the robbery it is difficult to organize any efficient resistance to it, and it is almost impossible to prevail upon the authorities to make any effort to secure new holdings, however valuable for beauty or association. A report like this is never widely circulated, but it ought to reach the eyes of enough intelligent men to arouse them from their apathy, and if the local newspapers of Massachusetts have any public spirit they will not cease to agitate this matter until the public title to common land is restored wherever such restoration is possible. It is to be feared that in many cases it is already too late for resistance. What the early settlers of the Commonwealth wisely secured for their descendants these recreant children have thrown away by culpable negligence, and unless vigorous action is taken future generations will find themselves shut out from the shores of the sea to which they have an inherited right.

Cold Storage.

EXPERIMENTAL attempts at cold storage began in this city eighteen years ago, and developed into a commercial industry three years later. Since then the knowledge of scientists and inventors has been combined with the practical experience and capital of warehousemen, until now the business of cold storage and freezing is a considerable factor in the market-supply of the world. At first the cold air from refrigerators on the ground-floor was forced to storerooms above, but this plan was soon given up for the system, still in limited use, of massing ice at the top of buildings, so that a current of cold air is drawn by gravity through shafts to the lower floors. By this system only cold storage at thirty-eight degrees and above is possible, while actual freezing is necessary for many classes of goods. One of the nine large cold-storage warehouses in this city uses a system of metal pipes ten inches in diameter, which encircle storage-rooms. These begin below the "charging-floor," the upper story of the building. Here ice is broken up by hand-power, the sectional trap-doors are lifted, and the pipes, set close beside each other and extending down to the floors below, are closely packed with ice and salt. The drainage from these, which is collected on the second floor, is utilized to cool rooms on the ground-floor to a temperature of forty degrees. This method of cold storage is especially adapted for holding comparatively small amounts of perishable goods, without the cost of expensive machinery.

The system most generally in use, however, is that of producing intense cold by the evaporation of ammonia, and one of the largest and best-equipped cold warehouses uses the so-called "direct expansion" system—which it is not necessary here to explain. In this immense establishment, which comprises in two warehouses 1,500,000 cubic feet of cold storage and freezing space, eight boilers, each of seventy-five horse-power, are used in the smaller building alone. The engines, compressors and all parts of the machinery are in duplicate, so that if one set is disabled the other set of machinery may be started and the requisite temperature throughout the building steadily maintained. Whatever the method used, the effect aimed at is the reverse of steam-heating, that is, to grasp and carry heat out of the rooms which it is desired to refrigerate. The brine which is produced by the ammoniacal-gas process and conveyed throughout the buildings in main pipes and smaller coils, leaves the manufacturing room in the basement at zero and returns from the circuit only five degrees higher. All this apparatus in specially constructed buildings costs money, and at the present time more than $4,000,000 are invested in cold storage in this city alone.

The first floor of these great buildings is usually occupied by offices and open space necessary for receiving and discharging goods, and the storage floors above are reached by heavy freight elevators. Passing through a small anteroom on leaving the elevator, the "bulkhead," or thick wall, which is air-spaced and padded so as to be as nearly as possible a non-conductor of heat, is reached. The heavy door swings open, and a change of fifty to seventy degrees is realized in a second of time. The purity of the atmosphere and the uniform temperature of each room or "box" are evident. Tiers of goods extend to the ceiling, closely packed along immense floor spaces, or in smaller lots in separated rooms. To the visitor, who, as well as the guide, is protected with heavy wraps, the long stretches of pipes and rafters covered with frost crystals glittering in the electric light present a strange and beautiful spectacle. Poultry, meats, fish, butter and eggs are stored in largest quantity, and actual experiments show that these usually perishable goods can be held in cold storage almost indefinitely, and meat and fish frozen and kept for five years have come out in good marketable condition.

By this preservative process a glut is prevented in periods of too plentiful supply, the season for perishable goods is lengthened to extend the year through, and prices are equalized to the profit of both producer and consumer. For example, yearling turkeys, which last February were stored and frozen, and since kept in a dry air at ten to fifteen degrees, are now the choice delicacy offered in the best hotels, and bring in the markets three cents a pound more than the best spring turkeys. But even in this favoring market there is not much profit to the merchant, since a third of a cent per pound is charged for the cold storage of poultry a month, and the higher rate of half a cent a pound each month for freezing. The prices charged for storage are, however, nearly fifty per cent. lower than they were ten, or even five, years ago.

The vegetable and fruit supply of this district has been strikingly influenced by cold storage. Peas, lima beans, lettuce, okra, celery and other seasonable vegetables are at this time stored by wholesale merchants for a few days or a week to hold steady a variable supply. Large quantities of domestic pears are also being carried on short-term storage. Considering the oversupply of California fruit now reaching this city, it is at first a surprise that none of it is being held for higher prices, but this is because the summer varieties, which alone are now coming, cannot be safely held even in the cold dry air of these warehouses. Tokay and other grapes of vinifera blood later in the season are successfully held for three weeks, and Cornichons have been kept for six weeks and even two months. The more delicate varieties of grapes from this state and Ohio remain in good condition for several months, until the supply is exhausted by Thanksgiving season. The tough-skinned Catawbas, however, are brought out of an atmosphere of about thirty-five degrees as late as April, when even the Almeria season is past. Domestic pears come from the refrigerating houses until midwinter, and some California pears, notably P. Barry, are kept successfully and profitably as late as June. Instances of large profit in carrying these pears are often cited. For example, lots stored in September, when they sold for $1.98 a box, commanded $8.00 a box nine months later.

Late spring varieties of Florida oranges often yield the largest profits of this crop, and are known to have quadrupled in value by July. In fact, oranges can be kept almost indefinitely, although they are rarely held more than sixty days without deteriorating somewhat in quality.

Horse-radish, stored last spring when it cost three to four cents a pound, is now selling as high as ten cents, and buckwheat-flour, after having been carefully cooled and kept against all objectionable intruders during the summer months, will soon be selling to eager buyers as the first new buckwheat of this year. Dried fruits and nuts are similarly protected during the warm weather, and seed corn and peas are kept in a freezing temperature to prevent sprouting and to destroy weevils. Owing to an abundance of cabbage last year, quantities of sauerkraut were stored, and this has proved a lucky venture on account of the failure of this season's cabbage crop.

These artificial low temperatures, besides their uses in arresting the decay and retarding the maturity of fruits and vegetables, are applied to other purposes connected with horticulture. Nursery-stock has been kept in a cool temperature in good condition for three years, with the roots plump and ready for growing when taken out. Hardy plants which are intended for forcing are often frozen after they are lifted, so as to give them their needed experience of a winter, after which they will push forward with healthy energy. Imported pips of Lily-of-the-valley are largely held in cold storage, not only to preserve them, but because they start more quickly and strongly after having been frozen. Bermuda Lily-bulbs and other stock of this sort are also treated successfully in this way.

Refrigerator cars have made it possible to transport California fruit to New York, and some of the freezing processes on shipboard have been so perfected that perishable fruit can soon be sent all over the world. Unsound fruit cannot be saved by cold storage, but it can be kept in good condition if it is sound and not too ripe when first placed there. Cold warehouses in fruit districts have been advocated for storing the products of a neighborhood, so that they can be held for shipping until a time when the demand would make it profitable. To a certain extent this is practicable, but, as a rule, it is not safe to ship fruits after they have been a long time chilled, and, in a majority of cases, it seems preferable to transport the fruit directly from the orchard or the vineyard to its destined market, and then, after carefully selecting and packing that which is not overripe, to hold it until the time of demand. Many of the grape growers of this state will ship directly from their vineyards a part of their crop this year, to be refrigerated in this city. It is claimed that the fruit keeps better when treated in this way than when it is stored in cold houses at home and shipped to this city afterward.

New York. *M. B. C.*

Nature's Planting Plans.

THE best suggestions for planting are often found by wood-borders and waysides, where combinations of color in nature produce effects which we may not be able to copy literally—indeed, any attempt at exact imitation is only a counterfeit of nature and is spurious art—but which certainly ought to furnish motives and hints that can be made useful when we are growing plants, not so much for the purpose of displaying them individually as of grouping them in arrangements which will have a pictorial effect. A point to be noticed in natural combinations is that there is usually a great deal of green of one shade or another in them all, so that while we often see considerable masses of the brightest colors, they always appear against a green background where they show to best advantage.

On a recent journey through New Jersey I observed the railway-banks bright with the orange flowers of Asclepias tuberosa, and these seemed brighter still because of the meadow which stretched beyond them; and in this same meadow, farther on, the lilac-purple of the Liatris, standing in the grass and softened by the distance, was very pleasing. Another pretty combination was a field of Cat-tails with the rose-colored flowers of the Swamp Rose Mallow glimmering behind and through them. In the pure sand of The Barrens, Cassia chamæcrista often stretches along the track like a band of gold, and one can ride by it for miles and never tire, so long as the green grass and foliage beyond serve as a foil and contrast.

One picture of which I caught a brief view as we rolled by was that of a brackish pond surrounded with high Sedges, and among these were groups of pink and white Rose Mallows. As a relief to the monotonous level of the place there were two hummocks upon which strong masses of Clethra had grown and were then in full flower. In front of these, toward the edge of the pond, were lower Marsh Grasses, overtopped with the white heads of Cotton Grass and the white flowers of Eupatorium, and these again were pierced here and there with the intense purple spikes of Vernonia.

Arnold Arboretum. *Jackson Dawson.*

Foreign Correspondence.

London Letter.

THERE were more new and interesting plants than usual exhibited at the meeting of the Royal Horticultural Society held on Tuesday last. In addition to those here described there were new varieties of Gladiolus from Messrs. Kelway, of Langport, whose development of this genus from the point of view of horticulture is marvelous. Dahlias also were largely exhibited and some were awarded certificates. A group of Crotons, comprising fifty-seven varieties, all represented by perfectly grown, richly colored little specimens about two feet high, was sufficiently attractive to recall cultivators to the value of these plants, now fallen into comparative neglect. New Caladiums, new Cannas, a group of Cockscombs, from Mr. Cannell, showing twelve distinct shades of color, with large groups of choice herbaceous plants, were principal features among the exhibits.

DISA NERVOSA.—Although described by Lindley forty years ago from specimens collected by Drège at the Cape, this distinct and handsome-flowered species has only recently been introduced into cultivation, plants sent to Kew from Natal last year being now in flower. The whole plant, including the spike, is two and a half feet high; the leaves are linear-lanceolate, ten inches or less in length, bright green tinged with red at the sheathing base. The scape is erect, leafy, and it bears two dozen flowers, forming a spike five inches across and high. The pedicels are over an inch long, the bracts linear and nearly as long; segments of the flower an inch long, curved, the dorsal sepal arched and concave, the base prolonged into a straight slender spur nearly an inch long; lip very small, concave, and attached to its base is a slender filament an inch long, which stands straight out from the flower, and is slightly curved and thickened at the tip. The whole flower is colored bright rose-pink. The genus Disa is a very variable one, and it is difficult to see at a glance the generic relationship of such species as the above and D. grandiflora and D. graminifolia.

LÆLIO-CATTLEYA BROOMFIELDENSIS.—This is a new hybrid between L. præstans and C. aurea. It has the general habit of the Lælia slightly modified, the flowers being larger and the lip very handsome, intermediate in size and form, and colored rich maroon-crimson, with orange veins at the base. It was awarded a first-class certificate and was generally considered to be one of the best of recent hybrids. It was shown in flower by Mr. W. Wells, of Broomfield, Sale.

CYPRIPEDIUM W. R. LEE.—This hybrid between C. superbiens and C. Elliottianum was raised by Mr. Lee, of Manchester, who showed it in flower this week and obtained for it an award of merit. It is in the way of C. Morganiæ, but the flowers are larger, coarser and duller in color, being greenish white and dull brown-purple, the petals dotted with black-purple. It is only fair to say that there were good judges who considered it one of the handsomest and most striking of hybrid Cypripediums.

CYPRIPEDIUM CHARLESWORTHII.—Messrs. H. Low & Co. exhibited this week a group of over sixty plants of this in flower, which showed considerable variety in the shade of mauve or rose-purple and in the shape of the dorsal sepal. It is a first-rate Cypripedium, and is said to be as sturdy as C. Spicerianum, which is now generally grown in a cool house along with C. insigne.

CATTLEYA ASHTONIANA.—This new hybrid between C. Harrisoniæ and C. Warscewiczii (gigas) has the pseudobulbs and foliage of the former and flowers like those of the latter parent, but smaller, and colored pale-mauve, except the broad labellum, which is deep crimson with purple

streaks and a yellow throat. It was raised by the exhibitors, Messrs. Lewis & Co., Southgate.

Bletia Watsoniana was shown as a new plant by Messrs. Sander & Co. and obtained an award of merit. According to Mr. Rolfe, however, it is B. catenulata of Ruiz & Pavon, a Peruvian species in the way of B. secunda. Although not new to science it is new to cultivation. It has large pseudo-bulbs, plicate leaves, and an erect scape bearing a few medium-sized rose-purple flowers.

Adiantum amabile plumosum and A. Hemsleyanum.—These two new Ferns obtained certificates this week and are certain to become favorites in the garden. They were exhibited by Mr. May, of Edmonton, a famous grower of and dealer in Ferns, with whom they had originated. The first-named has fronds of the same graceful character as the type, but the stipes are shorter and stiffer and the divisions of the frond shorter. It may be described as a form of A. amabile with the habit of ordinary A. cuneatum. It is probably a sport from A. cuneatum. The second, A. Hemsleyanum, has fronds eighteen inches high, semi-erect, with pinnæ like those of A. cuneatum, but less crowded and more rigid. It is a perfect plant for dinner-table decoration, owing to the grace and looseness of its fronds, and it is likely to become popular with growers of plants for furnishing ball-rooms, etc.

Pteris biaurita argentea.—This is a distinct and ornamental variety of one of the most useful, as it is one of the most cosmopolitan, of all Ferns. Mr. May exhibited fine examples of it this week, and it was awarded a first-class certificate. It differs from the type and all other cultivated varieties in having stout, sturdy fronds, the pinnæ almost leathery in texture and pleasingly variegated with silvery gray on a green ground.

Pteris serrulata gracilis multiceps.—This lengthy name is fairly descriptive of an exceptionally elegant variety of this most multifarious Fern. It was shown by Mr. May, and was awarded a certificate because of its drooping, graceful habit, the fronds arching over, and the very narrow pinnæ ending in elegant tassels. It is the prettiest of the many smaller forms of this Pteris. A plant in a five-inch pot had a tuft of fronds nine inches high, a foot through, and these completely hid the whole of the pot in their tessellated ends.

Begonia Rajah.—The number of Begonias that are popular because of their leaf variegation is considerable. Messrs. Veitch added one of decided prettiness last year in B. decora, and now Messrs. F. Sander & Co. have added another of equal promise, though widely different in character. It was shown under the above name this week, and received a certificate. Its origin has not yet been published, but I suspect it is Malayan. It has a fleshy, scale-clad root-stock or stem, from which spring suberect leaf-stalks six to nine inches long, supporting orbicular leaves about six inches across, the surface bullate and colored dark brown, with broad reticulating lines of bright green.

Begonia Rex-Socotrana.—This is a new hybrid between the two widely divergent species named, which has recently been raised in the nurseries of Messrs. J. Veitch & Sons. It is chiefly interesting as proving that such a cross is possible. It was exhibited this week, but obtained no award.

Asparagus sarmentosus.—One of the prettiest of greenhouse-plants now flowering here is a specimen of this Cape Asparagus, which was brought from near Grahamstown in 1887, and which is now an elegant mass of stems two feet high, clothed with numerous branches and falcate green leaves in such a way as to give each branch the outline and fullness of a fine fox-brush. The plant is evergreen, and worth growing for the sake of its elegant branches alone. But when these branches are transformed, as they have been this summer, into delightful plumes of white fragrant flowers, their decorative value is increased tenfold. There are more than a score of species of African Asparagi in cultivation here, and this is by far the prettiest of the larger-leaved sorts. A. sarmentosus is an old inmate of gardens, but it appears to be variable, and probably this form now at Kew is a superior one. Except on this theory, it is difficult to understand how this species has been overlooked in modern horticulture.

Eucryphia pinnatifolia.—This handsome Chilian shrub is flowering exceptionally well in English gardens this year. It is better at Kew than I have ever seen it, bushes five feet high being laden with flowers. It will bear twenty degrees of frost, possibly more, if the growth is well ripened, and it does not like drought. Although introduced from Chili twenty years ago by Messrs. Veitch, it has not yet become a popular shrub with us, but its success this year is sure to bring it into general favor. In Chili it forms a bush ten feet high, clothed with dark green, glabrous, pinnate leaves six inches long. The flowers are developed with us in July and August, each one being three inches in diameter, pure white, with a large bunch of slender stamens tipped with brown-red anthers. They are more cupped than a rose, otherwise they resemble a beautiful white single rose, and are superior to any rose in lasting several days after expanding.

Rubus Phœnicolasius.—This was shown as a new plant, and was awarded a first-class certificate. It is likely to receive more attention in England than it has hitherto, for, except to very few, it is an unknown plant here, and those who know it have formed but a poor opinion of it.

[This plant has been known for a great many years in this country, and under the name of the Japanese Wineberry it has lately been disseminated pretty widely among farmers and fruit-growers. There are varying reports as to its merits, but it is not considered of any value as a market fruit on account of its softness. It has a sprightly acid flavor, which is liked by some people, and it is useful for various culinary purposes. It is hardy as far north as New York certainly, and it is worth planting for ornament, if for no other purpose. The opinion seems to be gaining ground that it will find a permanent place for home use in a small way in country gardens.—Ed.]

Carnations.—Every meeting of the Royal Horticultural Society brings forth new and meritorious varieties of these Pinks, a fact which shows the popular interest in them. This week the following received awards: Ellen Terry, a large full white, first-class in every way; Paradox, a border variety with full, broad-petaled, bright scarlet flowers; Waterwitch, a blush-white, good in size and form. These were shown by Mr. J. Douglas, Great Bookham, now a nurseryman, but still devoted to his old favorites—Carnations, Auriculas, etc.

London. *W. Watson.*

New or Little-known Plants.

Nymphæa Sturtevantii.

THIS is one of the newer varieties of tropical Nymphæas and one of the handsomest and most distinct of Water-lilies. Its history, as given by its originator, Mr. E. D. Sturtevant, of Bordentown, New Jersey, is this:

Nymphæa Sturtevantii is not a hybrid in the ordinary sense of the term; it is a seedling sport from a hybrid. Its history is as follows: About 1880 I had a plant of the true Nymphæa Devoniensis growing in a tank built especially for the Victoria regia. It was in the open air, and the Nymphæa received the same treatment as would have been given to a Victoria, namely, a large bed of very rich compost and artificial heat. The plant attained great size, covering a space of twenty feet in diameter, having leaves twenty-five inches across, and flowers of the breadth of twelve inches. I made no attempt at hybridization with these flowers, nor can I remember growing any other plants in the vicinity to whose influence the new variety can be traced. A seed-vessel was allowed to ripen, and the next winter the seed from it was sown. Numerous young plants were raised, and among them one, and one only, appeared with leaves entirely distinct from the parent. This proved to be a new variety, and from its immediate ancestry it seems that it may be a reversion toward some prehistoric type, or an evolution of a new one. The cup-shaped form of the flower, the great breadth of the petals, the increased size

Fig. 57.—Nymphæa Sturtevantii—reduced.—See page 354.

of the stamens, the great abundance of pollen, are all marked characteristics. Mr. W. Watson, of Kew Gardens, speaks of the color of the flowers as a "soft delicate pink," but as grown in the open air in America, the color is deeper, especially if the water is artificially heated, when it is as deep a red as is ever found in N. rubra, though of a different tone. Mr. Watson speaks of the leaves as "apple green"; here they are often near the color of Coleus Verschaffeltii. I have never known N. Sturtevantii to produce seed. While it may be well grown with the treatment commonly given to N. Devoniensis, the best results are obtained when it has abundant root-room and artificially heated water.

Nymphæa Devoniensis, given as the parent of N. Sturtevantii, is an hybrid produced at Chatsworth in 1851 by Sir Joseph Paxton, and seemingly considered by him a mule, and was so described in the first notice of the variety in the *Gardeners' Chronicle*, July 10th, 1852. It is usually considered sterile by cultivators, and an examination of an ordinary flower will show that while it is well furnished with pollen, the female parts are imperfectly developed. It seems that these organs became fertile under the stimulus of Mr. Sturtevant's generous culture. It is, however, a curious freak that from the fertile seed produced by this plant one only of the number should have varied from the type.

There is much confusion among the Nymphæas, both hardy and tropical, and Nymphæa rubra, the grandparent of N. Sturtevantii, has not escaped its share. Its flowers are fertile and readily cross with other species, and even when uncrossed the seedlings sometimes vary in size, form and coloring. There are several forms grown in gardens; and though this and N. Devoniensis have been often confused by growers, it does not seem difficult to fix the normal types. We have little help, however, toward this in the published figures of N. rubra in the *Botanical Magazine* and Paxton's *Magazine of Botany*. In the former it is figured as a dark rosy carmine flower, quite single and with loose irregular petals, which are black on the reverse, resembling the figures of the flower of N. rubro-rosea, which is somewhat more double and lighter-colored, with bright yellow stamens. The *Magazine of Botany* figures N. rubra as resembling a very bright rich crimson Cactus Dahlia, with stamens of the same color, but of the normal shape as we know them.

Making allowances for the deficiencies of art in these figures, Nymphæa rubra in our gardens has taken on a nobility of form and a delicacy of color unknown to those by whom they have been figured. Good forms of this plant grown in our gardens are of a deep rosy carmine, eight to ten or more inches in diameter, with petals intermediate in width between those of N. Devoniensis and N. Sturtevantii, and not as sharp-pointed as those of the former variety. The leaves are a very dark olive-green, with darker spots, sometimes quite indistinct. The petals are narrow, strap-shaped, dull brick-red, and with two narrow lines of yellow anthers on the inner side.

Nymphæa Sturtevantii is, as shown in the illustration (see page 355), a variety with wide petals and somewhat cupped form. The coloring is brighter than that of N. rubra and not so bluish in tone. The leaves are distinct from those of all other Nymphæas, with a color difficult to describe, but of a dull reddish coppery hue. It is a beautiful plant when in flower, but is not so free in bloom usually as its parent. N. Devoniensis is now well known as a beautiful night-blooming Lily, with flowers of a still lighter shade, with narrow petals and very dark shining leaves, whose rich color reminds one of the Copper Beech.

In the first description there is a seeming confusion as to whether Nymphæa Devoniensis is a hybrid of N. rubra with N. dentata or with N. Lotus. N. rubra is classed as a red form of N. Lotus, and the other parent may be the ordinary N. Lotus or the N. Lotus of Sims (N. thermalis). While N. dentata and N. Lotus are botanically alike, as garden-plants they are very dissimilar, the latter, as we know them, being cup-shaped, and the former being very open, with somewhat narrow petals. In seeking to duplicate N. Devoniensis one would naturally try N. dentata as the pollen plant, and expect forms approaching that of N. Sturtevantii when N. Lotus furnished the pollen. It would be interesting to know the exact difference in forms between the plant illustrated and N. Kewensis, which in 1888 was said to have been secured between N. Lotus and N. Devoniensis. Some promising crosses between N. dentata and N. rubra are now under trial by American growers.

For the opportunity of figuring this flower we are indebted to W. W. Lee, Esq., of Northampton, Massachusetts, who not only grows Nymphæas to great perfection, but has secured a remarkable series of life-size photographs of the different species. The picture, which had to be reduced one-fourth in order to appear on a page of this size, represents the flower on the third day after opening. It is at its best on the fourth day.

Elizabeth, N. J. *J. N. Gerard.*

Plant Notes.

Pyrus arbutifolia.—A correspondent who has been observing the Choke-berry, as it frequently appears along the roadsides in western New York, writes to inquire why a shrub so attractive has not been commended in our pages for planting in parks and private grounds. As a matter of fact, attention has been called to this plant in every volume of Garden and Forest. Its handsome white flowers, nearly an inch across, often tinged with purple, and with conspicuous brown anthers, are borne in downy corymbs, which make it exceedingly attractive. There are two varieties of the plant so well marked as to suggest that they be made separate species. One bears scarlet fruit and one black, the first having a rather more southern range than the other, although the plants appear together occasionally in New England. The scarlet-fruited plant blooms in early June, and the fruit, which does not ripen until late in October, remains on the branches in full color well into the winter. The black-fruited Choke-berry flowers a fortnight earlier and ripens its dark vinous purple and lustrous fruit early in September. In habit this plant is rather more dense than the scarlet-fruited kind, and it has more ornamental foliage. The fruit varies much in color, some varieties being deep wine-colored, but it all falls as soon as it is ripe. Pyrus arbutifolia was figured in vol. iii., page 417, and the differences between the two forms were fully explained. Both of them vary considerably in the shape of the leaves and in the size and color of the flowers, and it is not improbable that they could be greatly improved by cultivation and selection. Certainly, they are both desirable hardy shrubs.

Gordonia Altamaha.—Something more than a month ago a correspondent in Washington sent us several of the Camellia-like flowers of this tree, and a few days since we were favored in the same way by Mr. Joseph Meehan, who has more than once, in these columns, assured all who have been deterred from planting it on account of its reputation for tenderness, that it is reliably hardy, at least as far north as the latitude of Philadelphia. Certainly there are some very fine examples in Fairmount Park and in Germantown. The original tree in Bartram's garden died some years ago, but a sucker from it is now living, and the largest tree in Germantown, which is now some twenty feet high, was taken from a layer of this plant. The tree will thrive best under conditions favorable to Rhododendrons—that is, in deep rich soil and in a partly shaded condition. It cannot endure hot, shallow soil. The Gordonia orginally came from Georgia, although, as it is well known, it has not been seen in a wild state since Bartram saw it more than a hundred years ago. Perhaps it might thrive in sheltered situations considerably north of Philadelphia; indeed, it flowers annually in the Arnold Arboretum, but every autumn the tree, or shrub, as it is there, is pegged down to the ground and covered with leaves and soil. Wherever it will live it exceeds in beauty any of our summer-flowering trees. These flowers in the latitude of Washington are produced continually from July

until the middle of October. They are pure white, and bear some resemblance to the flowers of the smaller Magnolias. They have five broad petals somewhat incurved, so that they never open widely, but give the flower a half-expanded appearance. They are some three inches across, and a cluster of yellow stamens and anthers adds much to their beauty. The odor is very delicate and contains a suggestion of tea, which is hardly surprising since Gordonia is as nearly allied to the Tea-plant as any of our American trees. The leaves are dark, with an evergreen appearance, and they turn in autumn to rich crimson. Altogether, its charms are sufficient to tempt any planter in the middle states who has a suitable soil and position to test the hardiness of this Franklinia, as it is often called in the catalogues.

VERONICA LONGIFOLIA SUBSESSILIS.—A vase filled with tall spikes of this hardy herbaceous Speedwell at the exhibition connected with the Florists' Convention reminded us once more that this is probably the best among the late-blooming species of this numerous and very useful genus. This variety is perfectly hardy, the spike is much longer than that of the species, and the flowers are larger and of an intense blue and singularly lustrous. It grows from two to four feet high, according to the richness of the soil in which it is placed, thriving best in deep rich ground and in open situations. It is easily increased by division of the roots. Of course, there are other species which should not be neglected, among them V. cercæoides, which blooms in late spring, and the low-growing V. rupestris, which closely follows it and spreads out in a mat of bright color. The hoary-leaved V. incana is well known as a good plant for rock-work and effective in border lines, while our native V. officinalis has proved an admirable plant under trees and other shady places where the grass will not grow, covering the ground with a permanent sod. The European variety, V. repens, is another creeping species which is said to make a close sward-like growth in a short time. All these have their special uses and their special seasons; but for flowering now, the Japanese plant, which is the subject of this note, is so robust and distinct that no considerable collection of hardy plants should be without it.

Cultural Department.

Ornamental Fruits for the Conservatory.

THERE is no lack of flowering plants for the winter decoration of the conservatory, but it should not be forgotten that well-grown specimens of certain berry-bearing plants will prove equally attractive, especially for temperate or cool houses, such as are frequently formed by enclosing a portion of a veranda. A structure of this kind is often the only available one for the amateur cultivator, but it is capable of giving much pleasure to the owner, providing a proper selection of plants is made.

Among the species adapted to such use are the Aucubas, plants which are nearly hardy and have such tough foliage as to be almost dust-proof. Aucuba Japonica is an easy subject to manage, requiring only to be potted in good loam, with sufficient drainage to protect it against stagnant water at the roots. Cuttings from half-ripened wood root readily, and the young plants will make the best progress when planted outdoors during the summer, although they should be lifted and potted up before hard frost comes in the fall. These plants are unisexual, and it is, therefore, necessary to have both male and female in order to secure a crop of berries. The fertilization of the female flowers is very readily performed, it being only required to shake the pollen from the male plant over the flowers to insure the setting of the fruit.

Callicarpa purpurea, though quite hardy in many portions of the United States, is a highly ornamental species for indoor use, its slender shoots being profusely dotted with small clusters of purple berries, which are not large enough to be very striking individually, but decidedly attractive on the plant. This, also, is not difficult to propagate from cuttings of soft wood in the spring, while hard-wood cuttings may be handled much the same as those of Deutzias and similar shrubs, but, naturally, take somewhat longer to root than those of young growth.

The Ardisias should not be overlooked if the temperature of the house does not go below forty-five to fifty degrees in the winter, and of these the well-known A. crenulata is probably the most satisfactory, since it makes a sturdy dwarf plant and can be nicely berried while growing in a five-inch pot. A. crispa is another good form, somewhat stronger in growth than the foregoing, and, like that species, carrying bright red berries about the size of peas. The culture of these plants is quite simple, good loam of a sandy character being the best compost, but strict attention should be given to watering, for while they require abundant moisture during the growing season, yet stagnant water at the root will cause total failure.

The Jerusalem Cherry, which does not come from Jerusalem and is not a Cherry in any proper sense of the word, but is known botanically as Solanum capsicastrum, is one of the best plants with ornamental berries for amateurs. It thrives under ordinary care, and its bright fruits are freely produced and last in full beauty for a long time. S. capsicastrum can be multiplied either by cuttings or from seeds, and the young plants should be grown on out-of-doors during the summer, with frequent pinching of the leading shoots to keep them in shape and produce a stocky growth.

The dwarf Oranges are also good subjects, with their golden fruits, glossy foliage and fragrant flowers. They are interesting and attractive at all times, and particularly so when the beauty of fruit and leaf and flower are all displayed on a single plant at the same time.

The Prickly Heath, Pernettya mucronata, is another pretty plant for a cool conservatory. It has a shrubby form, with small stiff leaves somewhat resembling those of an Epacris. The flowers are small and white and are followed by numerous berries about the size of large peas, and varying in color on different plants, from pink to dark red, or sometimes almost black. This Pernettya is, perhaps, more difficult to handle successfully than the species previously noted, but it is quite worthy of the extra effort that may be required during our hot summers to keep it in condition.

Holmesburg, Pa. *W. H. Taplin.*

Eremurus robustus.

OF the genus Eremurus I have practical knowledge of the species robustus only, but my experience with that has been so satisfactory that I long to know every one of them and have taken steps to that end.

My plant came from Dammann & Co. in the shape of a tuber with six fleshy arms or prongs, all in the same plane, and much resembled a star-fish. It was about two inches in diameter. The purchase was made in the summer of 1891. As I knew nothing of its hardiness I planted it, in November, in a cold frame and covered it with leaves. In the beginning of the following April I removed the covering and was much pleased to find my Eremurus already coming up to try the delights of a New England spring. The pushing bud was much unlike a living thing, except in color; it was more like a block fashioned by a carpenter, for so closely were the leaves pressed together that it seemed like a hexagonal prism of wood or stone, with each face cut away at the tip so as to form a pyramidal end. The plant grew well, and in July died down, as was its nature to do, and when I lifted it in August the root was as much of a star-fish as ever, but had attained a diameter of about ten inches. In November I again planted it and concluded not to risk breaking it by another removal. Those who have watched long for the blooming of a plant of whose beauty they have heard much can imagine my pleasure at finding a blossom-shoot appearing among the green leaves when they opened out last April.

The stalk grew rapidly, so fast that I almost fancied that I could see an increase in its height day by day. It finally reached a height of six feet and seven inches—the flowers occupying the upper thirty inches. The first bloom expanded on the 29th of May, and in spite of the dry weather the spike was not through with its display for three weeks. The flowers were of the tint of a peach-blossom and were nearly two inches across; the whole number of them was 246. It grew in such a position that it was seen by a person approaching the house against a dark green background of Cedars, and it was, on the whole, the most admirable thing I have had for many a day. Thirty-nine of the flowers set seed—the seed-vessels being of a spherical shape—and as they ripened assuming an upright position so that their axes were at right angles to the stalk of the flower which produced them. On the 23d of July all were ripe, and I at once sowed the seed. To-day, August 26th, several of the seedlings are three inches high, while others are coming up.

Canton, Mass. *W. E. Endicott.*

Kniphofias.

SOME two years ago we were favored with two packets of Herr Max Leichtlin's own hybridized seeds of these Torch Lilies, and though some flowered last year, the majority are in bloom for the first time this season. We have heard a good deal lately of the advances recently made by this noted raiser of choice hardy plants in the varieties of Kniphofia (Tritoma), and those now in bloom here go far toward illustrating the fact that the old introduced species are surpassed in vigor and beauty by these garden hybrids. There is a species called Kniphofia Leichtlinii, which comes from Abyssinia, and is very different from all other kinds, being deciduous, of dwarf habit, the tube of the flower shorter than usual, and the stamens and anthers being exserted, so as to give the spike an appearance quite distinct from all others. Another peculiarity is that the blossoms commence to expand from the top of the spike down, reversing the order of all other species that I have seen, and it is an advantage, as the spike is fully developed before the flowers begin to open. In the hybrids mentioned a large number are the result of crossing K. Leichtlinii with the older and more robust growers, and we have a distinct gain in every way in larger spikes of bloom and in varied colors. They still retain the deciduous habit, and this enables us to lift and store them in a very small space in the cellar in winter, there being no foliage to keep green. The hybrids with this parentage are easily discerned in fall, for after the first frost the leaves all turn yellow and mature at once, so that the plants can soon be lifted and stored, for in this section none of the family is hardy enough to stand the winter.

The parentage of the other seedlings is difficult to trace, but there are very few poor ones among them all, and some are of great beauty; one especially, now in bloom, has a flower-spike over a foot long, with four side branches, the flowers being of a clear bright yellow, with no red shading, while others are of the brightest possible vermilion-red.

Kniphofias have a distinct place in the flower-borders that they are well qualified to fill. At this period there are few plants in bloom among true herbaceous or hardy plants, the month of August being the poorest of the summer months, and this is when the Torch Lilies begin to come into bloom, and they last until frost has killed all outdoor bloom. In very favorable years we can harvest seeds, but more often they do not mature satisfactorily, but seeds can easily be purchased, and these germinate readily in the greenhouse in spring; the older plants may easily be divided when it is desirable to increase any particular variety, for we have found that seed cannot be relied upon to come true if saved from plants among a mixed collection, the flowers being a great attraction to insects, and in this way they become crossed.

South Lancaster, Mass. *E. O. Orpet.*

China Asters.—Of the many varieties of these flowers now catalogued it is difficult to choose which to grow, for the list is lengthened every year and becomes the more embarrassing to the cultivator. This season we have tried for the first time the strain known as Giant Comet, and it has proved to be the best novelty in China Asters which has lately been offered. The colored varieties are not as large as the white ones, which are of such unusual size that they resemble a good large chrysanthemum, the centre petals being narrow, almost thread-like, while the outer ones are broad and of good substance. The stems are long and may be cut for use in large vases, and for this purpose this strain cannot be excelled. Another variety we have tried this year is Semple's strain, which is most distinct in habit, taller and more vigorous than any I know, the plants growing nearly three feet high and the stems long in proportion. The large flowers of those we have are all of a pleasing shade of pink, the petals twisting and somewhat incurving very like what is called a Chinese chrysanthemum. These two kinds are genuine acquisitions to our list of summer flowers and well worth growing in any garden.

Boston, Mass. *P.*

Dewberries.—Repeated experiments with these plants lead me to discard them from any extensive culture. The only suitable method of growing them is to tie them to stakes five feet high, and cut them in repeatedly during growth. Any approximation to freedom not only makes them a nuisance, but prevents the yield of any fruit that is worth gathering. At the best, the plant tends to produce a larger proportion of knotted stubs in place of perfect berries. The lower limbs are dragged into the dirt by the weight of the fruit. A small plot of the Dewberry Lucretia can be used to decided advantage. Mulch around the plants during the bearing season, and lay them down for winter. The berry ripens two weeks ahead of the erect-growing blackberries, and sells for a good price. The average price is about fifteen cents; of blackberries, about eight.

Clinton, N. Y. *E. P. P.*

Correspondence.

Prickly Lettuce and some other Weeds in Iowa.

To the Editor of Garden and Forest:

Sir,—Some alarm has been felt in the west from the invasion of Prickly Lettuce (Lactuca Scariola). The date of the introduction and distribution of many of our foreign weeds over the United States will never be known, since botanists have, as a rule, not recorded the time of their first appearance. In the case of Prickly Lettuce, Russian Thistle, Spiny Nightshade, Hawkweed, Mexican Poppy, Cone Flower and some others, the local floras furnish data of the time of their introduction, but in the great majority of cases we know nothing.

The records for Prickly Lettuce and Russian Thistle are very full and complete. Prickly Lettuce was recorded by Dr. Gray (*Manual*, fifth edition, p. 281), in 1867, from Cambridge, Massachusetts. Since then numerous botanists have recorded its presence from the Atlantic states to Minnesota. It was a common plant in Madison, Wisconsin, in 1884, and I saw it abundant in the streets of north Chicago in 1885 and in St. Louis in 1886. I have, therefore, been interested in watching the plant in Iowa since 1889. At that time the weed occurred in the streets of several Iowa cities and villages, but was not abundant. Since then it has spread rapidly, and now occurs in every city I have visited during the last year. It is abundant, not only in vacant lots, in streets and along roadsides, but occurs in lawns, pastures and in woods. The weed is thoroughly naturalized, and many farmers and gardeners in Iowa believe it to be one of the worst they have to contend against. In lawns, while not as bad as Dandelions, it causes great annoyance. Many annual weeds are easily destroyed when cut off close to the ground, but this weed cannot be killed in this way, unless the root is cut at least an inch below the surface.

Prickly Lettuce has probably been adventive in Iowa for many years longer. It is recorded by Dr. Bessey (*Report State Ag. Coll.*, iv., 110) as occurring at Ames in 1871. In all probability it was adventive in many other parts of the United States. This fact indicates that it takes some time for a plant to become naturalized, but after it is naturalized it is able to spread rapidly. I have known of large patches of Ox-eye Daisy, Chrysanthemum leucanthemum, in western Wisconsin that have disappeared entirely without any effort. The same weed has been reported at Ames at different times since 1871, but it has not made much progress. Dr. Bessey, in 1871, states in relation to Squirrel-tail Grass, Hordeum jubatum, that it is "found along railroads; perhaps introduced." There is scarcely a town or city in Iowa where it does not now occur, seriously crowding Blue Grass in lawns. Sweet Vernal Grass, Anthex anthum odoratum, introduced in 1871, has extended but little. Spiny Nightshade, Solanum rostratum, though known to occur as a troublesome weed in the south-western states for many years, and during twelve or fifteen years in south-western Iowa, has been reported to me from a dozen or more localities in central and northern Iowa. It is not, therefore, making rapid headway. The Mexican Poppy, Argemone Mexicana, has been reported to me from southern Iowa, and I have seen it in Cedar Rapids.

From these and other observations we may conclude that annuals with ready means of dissemination are distributed more widely and are more easily naturalized, and naturalization takes place more readily in the case of European than American weeds. In this I do not consider weeds like Purslane (Portulaca oleracea), Plantains (Plantago major), Knotweed (Polygonum aviculare) and similar species that follow man.

Iowa Agricultural College, Ames. *L. H. Pammel.*

The Kentucky Coffee-tree.

To the Editor of Garden and Forest:

Sir,—In your number of August 15th, Mr. E. P. Powell recommends the Kentucky Coffee-tree for ornamental planting. It has all the good qualities he mentions, but probably he has never observed what happens when one of these trees is cut down. The ground is then filled with innumerable suckers. These are easily disposed of by the scythe, but they seem to indicate that the superficial roots spread enormously and

take a great deal from the soil. I can testify from an experience of many years that this habit of suckering is confined to trees which have been cut down. The suckers appear a hundred feet from the stump. This seems to show that the tree is one of that kind that has innumerable adventitious buds in the roots, which at once sprout when the trunk is cut off. Like the Sassafras, it will renew itself at once if permitted, and with wonderful rapidity.

Philadelphia, Pa. *R. C. McM.*

Hovenia dulcis.

To the Editor of GARDEN AND FOREST:

Sir,—In reply to Mrs. Dandridge's inquiry about the fruiting of Hovenia dulcis, I would say that some five years ago fruit of this plant was received here from the nursery of the late W. D. Brackenridge, Govanstown, Maryland, where a plant had been fruiting for several years. The large specimen tree on our grounds is in fruit now, as it was last year.

Germantown, Pa. *Joseph Meehan.*

Meetings of Societies.

American Forestry Association.—II.

PROFESSOR F. H. KING, of the Wisconsin Experiment Station, gave an illustrated account of some observations on the destructive effects of winds and the protection afforded by woodlands and shelter-belts. Without quoting the tables, we give the leading points of this instructive paper:

WIND-BREAKS.

We have in Wisconsin large tracts of land with soils of a light sandy character which give fair yields of excellent potatoes, but the clearing of these lands in large fields has disclosed the fact that they are liable to serious injury from the drying and drifting action of the winds.

After a rainfall of three-fourths of an inch on the 5th and 6th of May last the fields in one of these sections which was visited on the 7th had already drifted badly, and on the morning of the 8th the top soil, loosened by harrow, seeder and drill, had been so completely driven from many fields as to leave the grain kernels entirely naked, with the plants lying flat upon the ground, hanging by their roots and whipping in the wind. In many other fields, where the drifting had not been so bad, the Oats, which at the time stood about eight inches high, were cured like hay close to the ground, and even the leaves of Dock Sorrel, which in places stood among the grains, were blackened and so dry as to crumble in the hand. Some exposed eighty-acre fields of grain seeded to Clover were about ruined, the loose soil having been removed so entirely that the marks of the bottom of the shoe-drill could be seen over entire acres of ground. But the point to which special attention is invited here is that wherever a field lay to the leeward of any sort of wind-break the destructive effects of the winds were either wholly avoided or they were greatly reduced. It was found that even Grass-fields and fences lying to the west and north of grain-fields had, without exception, exerted an appreciable, and sometimes very marked, protective influence.

After making these observations the influence of the woodlands and wind-breaks upon the rate of evaporation to the leeward of them was investigated with modified Piche evaporometers. The first set of observations was made on a piece of ground planted to Corn lying to the south of a grove of Black Oaks having a mean height of twelve to fifteen feet. By setting the instruments at different distances from the belt of trees it was found that there was little difference in the rate of evaporation at points less than 120 feet away; but at 120 feet the rate of evaporation was 17.2 per cent. greater than at twenty feet. Little difference was found in evaporation at distances of 280, 300 and 320 feet, but the mean evaporation at these three stations was twenty-four per cent. greater than at the three nearest ones.

On May 31st another trial was made to the south of a Black Oak grove eighty rods square, where the trees averaged, perhaps, fifteen to twenty feet in height, and the instruments showed an increase in the amount of evaporation until a distance of 300 feet was reached, but beyond that limit the rate became constant. At 300 feet the rate of evaporation was 17.7 per cent. greater than at 200 feet, and 66.6 per cent. greater than at twenty feet from the woods.

Trials were also made to the leeward of a very scanty hedgerow, and of a Clover-field—the hedgerow being a strip of Blue Grass sixteen feet wide, in which there were scattering Black and Bur Oaks from six to eight feet tall, but the distribution of these was so irregular that there were many open gaps of twenty to forty feet. The Clover-field lay adjacent to and west of the Potato-field and bordering the Oat-field on the north, and had a width across which the air passed before reaching the instruments of 780 feet. Here again the observations showed an evident influence upon the rate of evaporation exerted by both the Clover-field and the hedgerow—the evaporation at 300 feet away being about 30 per cent. and 40 per cent. greater than at twenty feet distant from the hedgerow and from the Clover respectively.

In view of the observations here presented it appears to me that we have a case in which both the reservation of forests and the planting of trees may be urged as an expedient, not only for increasing the immediate crop-production, but for maintaining at a smaller cost a fair degree of fertility for the soil. In our state and in parts of northern Michigan we have had large tracts of land, which, owing to the small natural water capacity of their soils, are, when unaided, on the verge of barrenness, and yet which are capable of producing remunerative yields of potatoes and of other crops which mature with a relatively small amount of water; but I feel confident that the tendency of these soils to drift and to suffer from drought makes it expedient, if not necessary, to hold portions of these tracts in forests. The observations here presented lead me to feel that were these lands to be cultivated in narrow north and south fields, leaving belts of timber, and even planting them when necessary, primarily to break the force of the wind and to increase the relative humidity of the air which passes across the fields, the total agricultural output might easily exceed what would be possible were the whole surface cleared and tilled, unless irrigation is resorted to.

Then, again, nearly the whole timber district of the northern half of our state has now been so thoroughly deforested by man, fire and winds that the near future must witness a large influx of agricultural population. Indeed, large land-owners already have agents in Europe negotiating the establishment of colonies within our borders, and one early colony of Finns has been so planted on the shore of Lake Superior. If anything is to be done in the direction of forest-reservations, therefore, steps to that end should be taken at once.

Recent Publications.

Practical Botany for Beginners. By F. O. Bower, D.Sc., F.R.S. Macmillan & Co., New York.

The natural way to study botany is to begin with the common phenomena of plant-life as they present themselves to the senses and by observing and comparing them, to get some idea of their alliances, so as to classify them from their outward appearance and most conspicuous characters. These external and visible relationships between plants are always paralleled by inner or more recondite resemblances in cell-structure, which are revealed by the use of the microscope. It is the fashion in some cases to begin the study of botany now with the microscope, and to proceed from a study of the cell outward. To us this has never appeared to be the rational method. Of course, no one can know botany or any other branch of biological science without careful laboratory work, and when investigations of this sort are undertaken instruction is needed about the necessary apparatus, the preparation of material, the adjustment of the microscope, and all that. This is in reality elementary work of one kind, and it is eminently practical work, and when it is begun after some knowledge has been acquired of systematic botany, as it is generally understood, it is most fascinating as well as useful. This little book is an attempt to guide novices in their first steps in laboratory work. It begins with a list of the apparatus required for ordinary investigations; explains the methods of preserving material, with directions for cutting sections for mounting, etc., and then gives some practical exercises in the preparation of material and in the use of common micro-chemical reactions. The main body of the book is taken up with directions for the studying of vegetative organs and reproductive organs of various types. No guide available for elementary work of this sort is better than Professor Bower's, and undoubtedly it will find extensive use in every institution where there is a botanical laboratory.

Notes.

In a late number of the *Revue Horticole*, Monsieur Edouard André figures and describes a new variety of the common Lilac, which has been named Chamæthyrsus. It is the well-known habit of Syringa vulgaris to send up suckers, but in this variety each of the young shoots bears a truss of flowers at its extremity as it issues from the ground, so that it looks as if a flowering branch of Lilac had been cut off and thrust into the ground. This variety is to be sent out by Messrs. Machet & Josen, Chalons.

Mr. Henry Clinkaberry, gardener of C. G. Roebling, Esq., of Trenton, has sent to this office a three-flowered raceme of the beautiful natural hybrid, Cattleya Hardyana. The flowers have delicately mottled sepals, and the petals are daintily veined with white. The lip is a bold purplish crimson, the disk being lightly penciled with yellow, and a large blotch of deep yellow, almost orange, on either side. The flowers have a fragrance which, without being powerful, is refined and distinct. The plant came from the celebrated collection of Reginald Young, Sefton Park, Liverpool, and it is certainly one of the best forms of this rare and interesting hybrid. Mr. Roebling's plant now bears twelve blooms.

We publish in another column some facts in relation to cold storage, but it may be added that technically this phrase in the trade means the preservation of a temperature ranging from twenty-eight to thirty degrees, Fahrenheit, upward. For freezing there are special charges, and this means a temperature maintained from twenty degrees, Fahrenheit, downward. The softer small fruits, peaches, plums, grapes and pears, allow a range of no more than three degrees, that is, from thirty-three to thirty-six degrees, while apples can be kept to advantage at a lower temperature, and lemons and oranges do well at from thirty-eight to forty. Great care is taken to secure constant and equable temperature by different automatic systems and by regular and registered visits of watchmen.

As we have already reported, the European apple-crop is almost a failure, and large exportations from this country may therefore be looked for. Two thousand barrels were sent away last week, and more than twice that number will, no doubt, be forwarded during the present week. Inasmuch as there is not a full crop in Canada, and since the product of the United States will not be half that of an average year, it is fair to assume that prices will be high. In fact, the prices in England are already good. A few careless or unscrupulous shippers have done very much to injure the American export apple trade by sending inferior or badly packed fruit, and this tends to give a bad name to the entire supply from this side of the Atlantic. Newtown Pippins were always favorites in the English markets, but they have lost their position to some extent, owing to the fact that other green apples have been shipped from this country and falsely branded as Newtown or Albemarle Pippins. Red apples, such as Baldwins and Kings, now bring the highest prices.

Last year we published a complaint that Dahlias in certain sections failed to bloom, the buds seeming to dry off entirely or make imperfect blossoms only. This trouble is prevalent again this season in many places, and Mrs. W. Seliger writes from Hartford that she has discovered the cause to be the work of the common corn-stalk borer, Gartyna nitela. The moth of this insect is dark brown, sprinkled with yellowish dots, with a whitish band across the wing, and the caterpillar is dark brown, with three white lines on the back, the central one being continuous, while those on each side are interrupted. This borer drills into the stalk near the ground and eats out the pith, causing the death of the plant. The method generally suggested for fighting the insect is to pull up the injured corn-stalks as they begin to wilt, and feed them to the pigs, so that the worms will be destroyed. If this is carried on regularly there will be little danger that the moth will become so abundant as to be a serious pest. When it occurs on weeds or garden-plants these ought to be collected and fed to hogs or burned. Last year it was suggested by Mr. Slingerland, of the Cornell Experiment Station, that the four-lined leaf-bug, Pœcilocapsus lineatus, was the offender, and the fact that this insect attacked Dahlias had been put on record by Dr. Fitch thirty-six years ago. This leaf-bug punctures the flower-bud until it withers. A bulletin published by the Entomological Division of the Cornell Experiment Station last year gives all the facts known about this pest, and a summary of the methods of guarding against its attacks will be found in this journal (vol. vi., page 500). We should like to know whether the corn-stalk borer has been detected preying upon Dahlias in other sections.

To a correspondent who inquires of *The Rural New Yorker* whether it would be preferable to pick Maiden's Blush and Baldwin apples two weeks earlier than the usual time, so as to save loss by storms, etc., some interesting replies are made by experts. Dr. Hoskins states that apples will not wither if picked at any time after the seeds are colored. Usually the skin colors with the seed, but not always. Secretary Gold says that on the hills of northern Connecticut apples are safe on the trees till the middle of October, and improve in color, quality and size enough to compensate for the few that are blown off by winds in August and September while they are too green to pick. This year the extreme drought will cause apples to loosen earlier, and they should be watched and picked in season. Mr. J. S. Woodward says that apples picked when quite green will keep longer than if left to hang later on the trees, although they will shrivel slightly. The flavor will be injured, however, so that, on the whole, the practice is not a good one. Some persons have an idea that winter apples which hang on the trees after they are ripe will keep longer, but this is not the case, and the sooner they are picked after the seeds are entirely black, and put into a cool temperature, the longer they will keep. With early fall apples it will pay to go over the trees more than once, for if the large and mature apples are picked as soon as ripe the less-developed ones which are left hanging will often double in size. This is true of Duchess of Oldenburg, Sweet Bough and Maiden's Blush, and the larger yield will often more than compensate for the extra labor, to say nothing of the escape of risk from winds. Another correspondent asserts that when apples are picked as soon as they reach full size their flavor is improved, and they have less tendency to rot, while George T. Powell says that apples should be picked as soon as the stem will loosen from the branch without breaking. This year apples can be picked two weeks earlier than usual. The best keeping quality is obtained by picking the fruit as early as possible, and the finest flavor is insured by allowing them to reach fullest maturity on the tree. If the stems adhere and break the fruit will wilt.

Among the tropical fruits now exposed in the fancy-fruit shops are mangoes from the West Indies, and, judged by the specimens here, one wonders at the reputation they enjoy at home. The fact is that the varieties of mangoes differ from each other almost as widely as those of apples, and in most tropical countries little care has been taken to select choice kinds, so that it is only by a rare chance that a mango of high quality ever reaches this city. They retail at five cents each, and alligator pears bring $3.50 a dozen. Importations of bananas have slightly increased each succeeding month since early spring, and in August 600,000 bunches came into this city at prices fifteen to twenty per cent. lower than those obtained in July. Jamaica oranges are becoming abundant, and the later shipments are more nearly ripened than the first lots which began to come nearly a month ago. Most of this fruit comes packed in barrels holding as much as two and a half Florida orange boxes, and sells at wholesale at the low price of $2.50 a barrel. The first Florida oranges are looked for here by the end of September. Some Indian River russet oranges, juicy and of good flavor, said to be Hart's Late, are still offered at sixty cents a dozen, fresh Rodi oranges bringing the same price. The plums now coming from California are larger and more showy in color than those seen here a month ago, and Kelseys and Gros prunes are now almost as brilliant as the Hungarian prunes. Choice selected boxes of five dozen sell for a dollar. Seckel pears range from twenty-five to fifty cents a dozen for the best, according to size. Mammoth, Buerre Hardy and Bartlett pears, and nectarines of very large size and high color, bring sixty cents a dozen at retail, smaller fruit of the same sorts costing a third as much. Grapes are now here in greater variety than any other fruit. Besides the kinds of domestic grapes noted last week, California is now sending Rose of Peru, or what is sometimes known as Black Prince, good-sized, firm, round berries, clustered loosely in large bunches, and not considered one of the best grapes for long shipment. The yellow-green Chasselas de Fontainebleau, or Sweetwater, is quite abundant in our markets, which, while juicy and sweet, lacks distinct flavor. Black Sultana and Thompson's Seedless, a local variety of the golden-yellow Sultana, are also here, and the later Verdel, having oblong yellowish green berries, covered with an attractive bloom. So plentiful and cheap are the California and New York state grapes that Muscat of Alexandria, Chasselas and Black Hamburg grapes from Long Island hot-houses command but thirty cents a pound for the best.